Illinois Renewable Energy Access Plan

Workshop #2

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Agenda

- **Index: PJM Inventory x Draft REAP**
- **Background**
- **Generation Interconnection**
  - Today: Public Policy Planning
  - Tomorrow: Proposed Queue Reform
- **Transmission Planning**
  - Today: Public Policy Planning
  - Tomorrow: Master Planning Scenarios & FERC NOPR
- **Wholesale Markets**
  - Clean Energy Procurement Sr. Task Force

PJM Inventory x Draft REAP

Draft REAP	Objective & PJM Interactions
Strategic Element #1: Renewable electricity supply needs in Illinois are large and subject to high uncertainty, ranging from 64 TWh to 450 TWh by 2050	*Likely not applicable or not direct*
Strategic Element #2: Clarification of certain policy instruments and enforcement authorities will enable more accurate determination of the scale of clean energy needed and the reforms necessary to implement CEJA policies.	TBD
Strategic Element #3: Identification of renewable energy access zones (REAZs) should enable a repeatable process allowing Illinois to provide regular input to RTO transmission planning.	*Factor in REAZs into PJM's processes* 1. PJM queue reform **Key date(s)**: TBD 2. Existing PJM Public Policy Planning and State Agreement Approach **Key date(s)**: TBD 3. Developments on PJM 15-year Master Plan **Key date(s)**: 1/1/2023

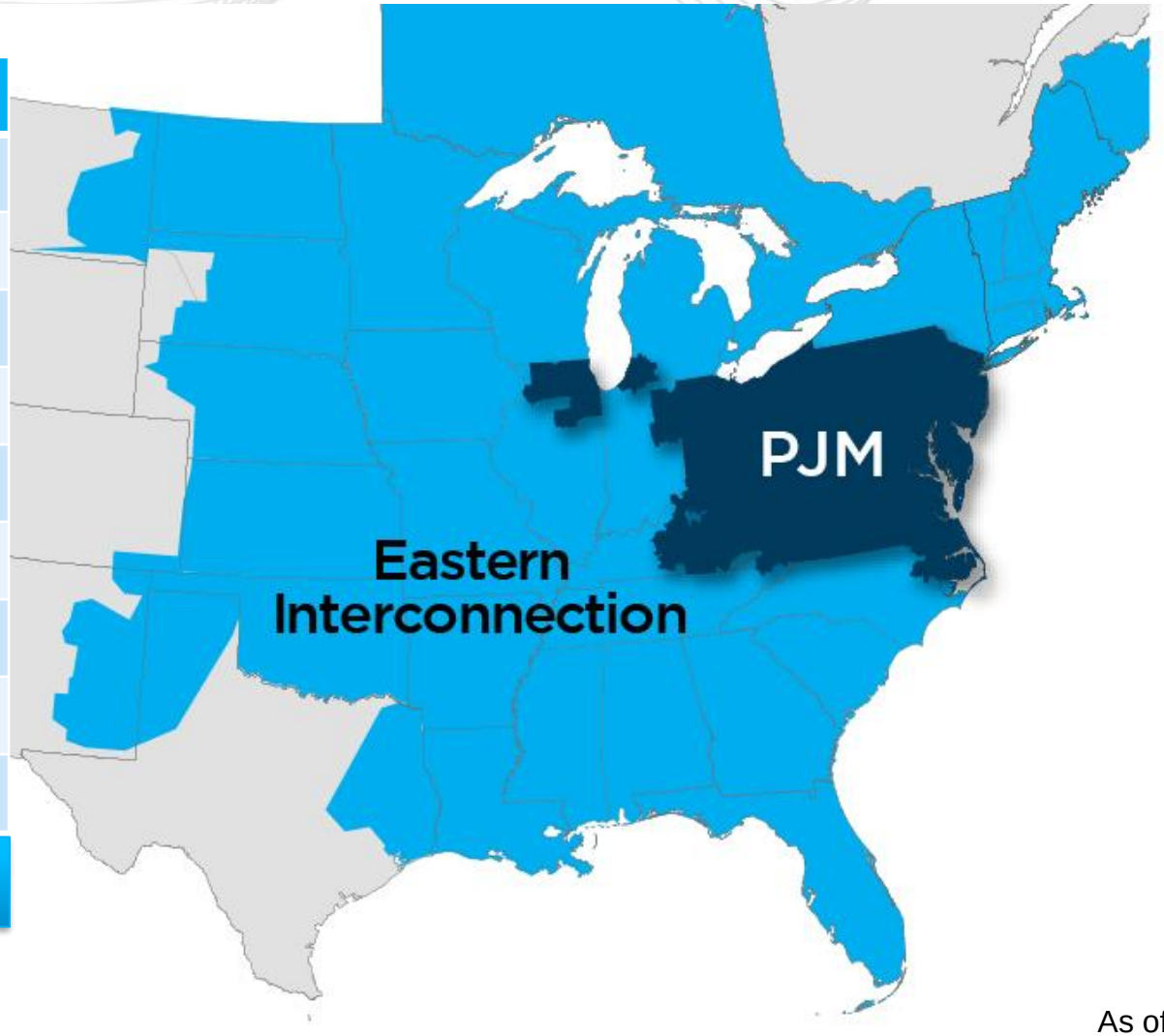
PJM Inventory x Draft REAP (cont'd.)

Draft REAP	Objective & PJM Interactions
Strategic Element #4: Existing transmission infrastructure should be optimized to support renewable resource deployment.	*Incorporate policy goals into planning processes* Developments on PJM 15-year Master Plan **Key date(s): 1/1/2023**
Strategic Element #5: Proactive planning of new transmission—with consideration of public policy needs—is superior to relying on interconnection processes to reach CEJA's goals. The final REAP will therefore not only highlight meaningful reforms, but also evaluate likely reform timelines, and aim to harness existing processes to the extent possible. The REAP will provide policy recommendations to continue improving regional planning processes to enable the energy transition (at p. 31).	*Incorporate policy goals into planning processes* 1. Existing PJM Public Policy Planning and State Agreement Approach **Key date(s): TBD** 2. Developments on PJM 15-year Master Plan **Key date(s): 1/1/2023** 3. FERC Notice of Proposed Rulemaking / Final Rule (*Building for the Future Through Electric Regional Transmission Planning and Cost Allocation and Generator Interconnection* - RM21-17) **Key date(s): TBD**
Strategic Element #6: RTO markets will require enhancements to support effective, reliable, and affordable implementation of CEJA policies.	*Incorporate policy goals market processes* Relevant developments under in PJM's Clean Attribute Procurement Senior Task Force. **Key date(s): 6/1/2023**

PJM as Part of the Eastern Interconnection

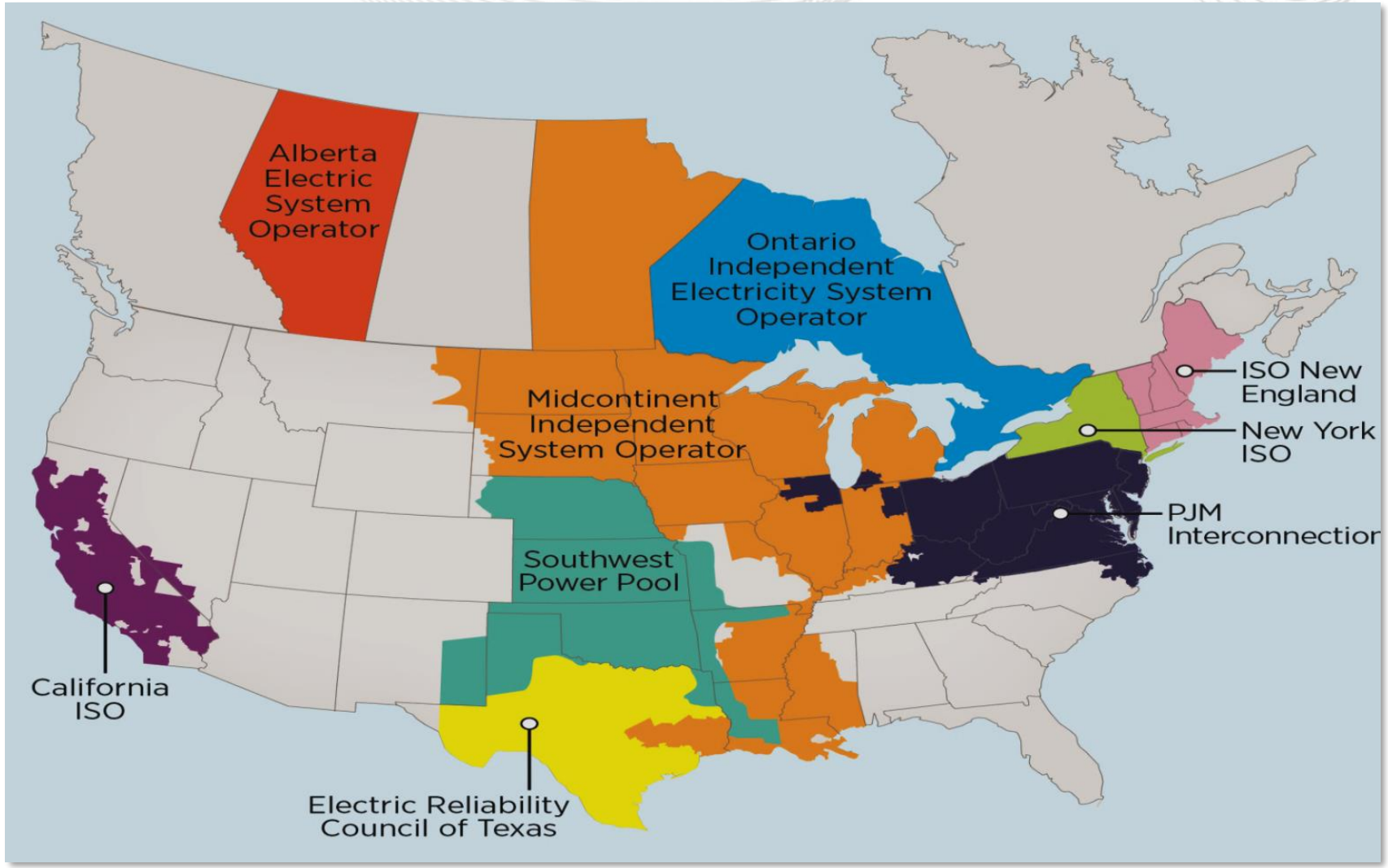
Key Statistics	
Member companies	1,060+
Millions of people served	65
Peak load in megawatts	165,563
Megawatts of generating capacity	185,442
Miles of transmission lines	85,103
2020 gigawatt hours of annual energy	782,683
Generation sources	1,436
Square miles of territory	368,906
States served	13 + DC

21% of U.S. GDP produced in PJM

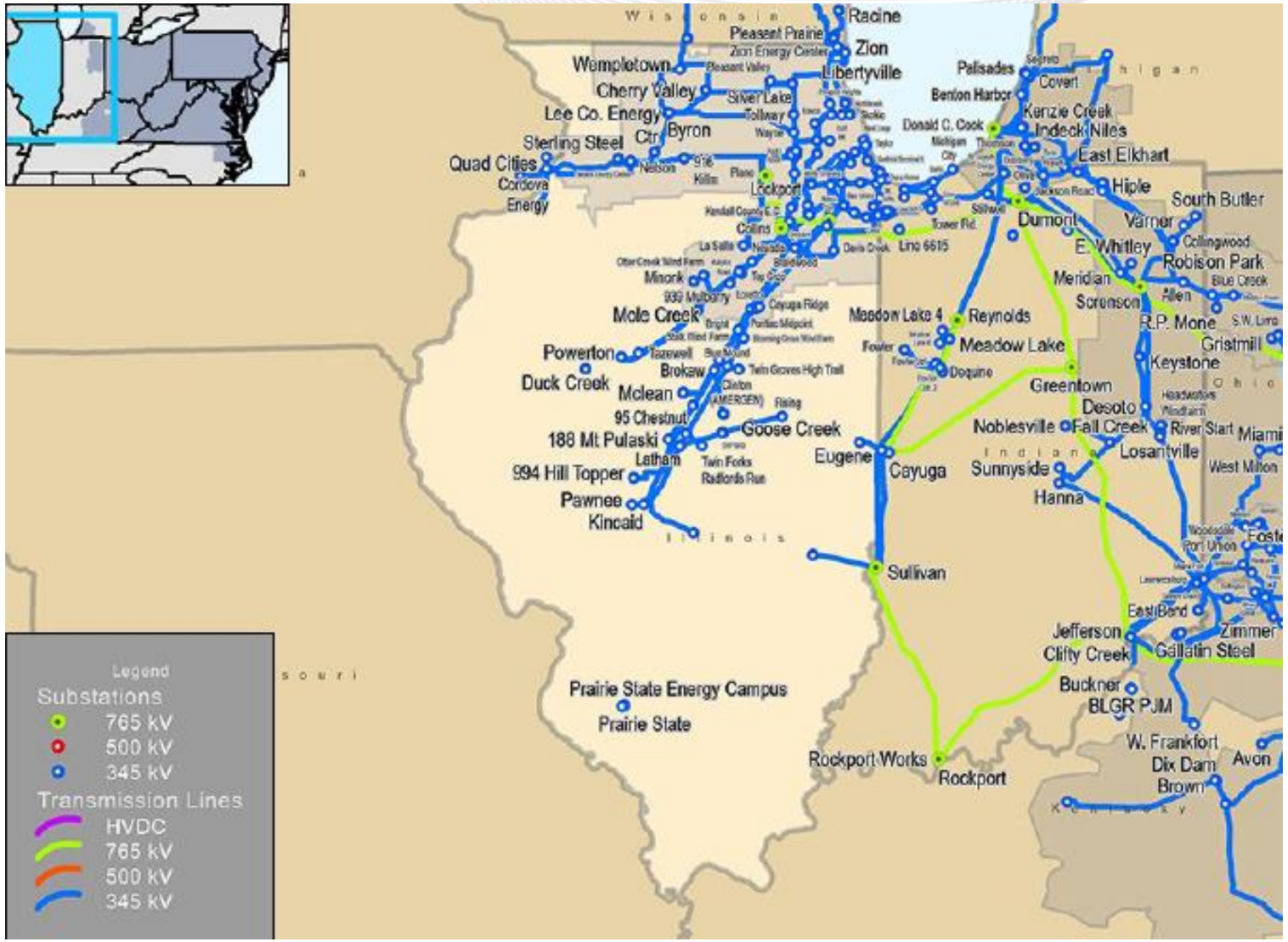


As of 2/2021

Nine Major North American RTOs / ISOs



PJM Service Area – Illinois



The PJM service area in Illinois is the ComEd zone and is represented by the shaded portion of the map.

PJM operates transmission lines that extend beyond the service territory.

PJM's Role as a Regional Transmission Organization

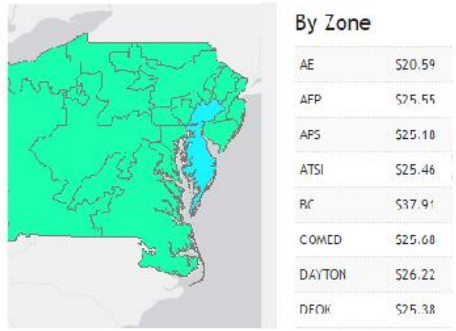
PLANNING

Planning for the future like...

OPERATIONS

Matches supply with demand like...

MARKETS



Energy Market Pricing like...

Major Work "Products" of System Planning

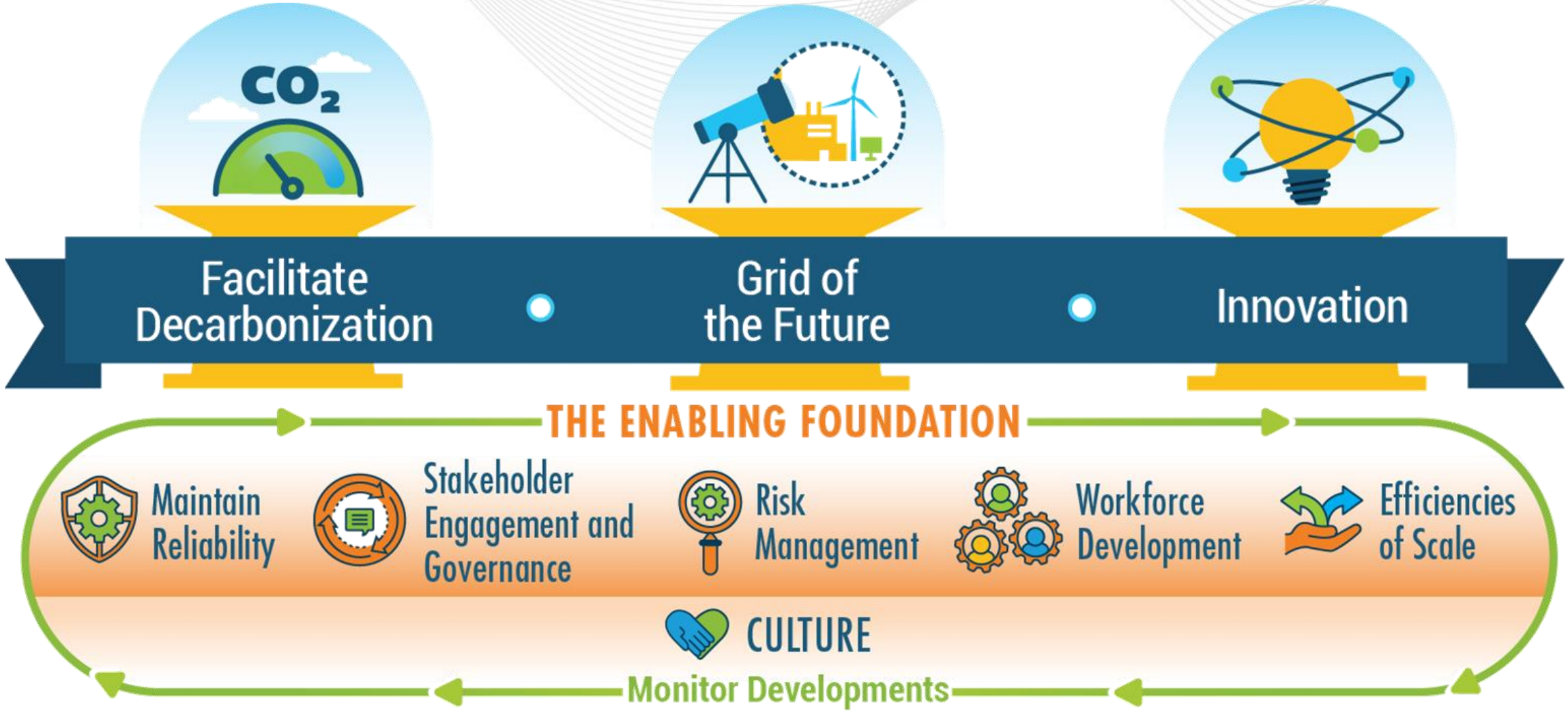
- Develop the load forecast for the PJM region
- Interconnection studies for new generation
- Prepare annual Regional Transmission Expansion Plan (RTEP) to identify the more cost-effective or efficient projects to assure continued reliable performance
- Assign cost allocation per TO-filed, FERC-approved methodology

Transmission Planner: The entity that develops a long-term plan for the reliability (adequacy) of the interconnected bulk electric transmission systems within its portion of the Planning Authority area

Resource Planner: The entity that develops a long-term plan for the resource adequacy of specific loads (customer demand and energy requirements) within a Planning Authority area

Planning Coordinator/Planning Authority: The responsible entity that coordinates and integrates transmission facilities and service plans, resource plans and protection systems

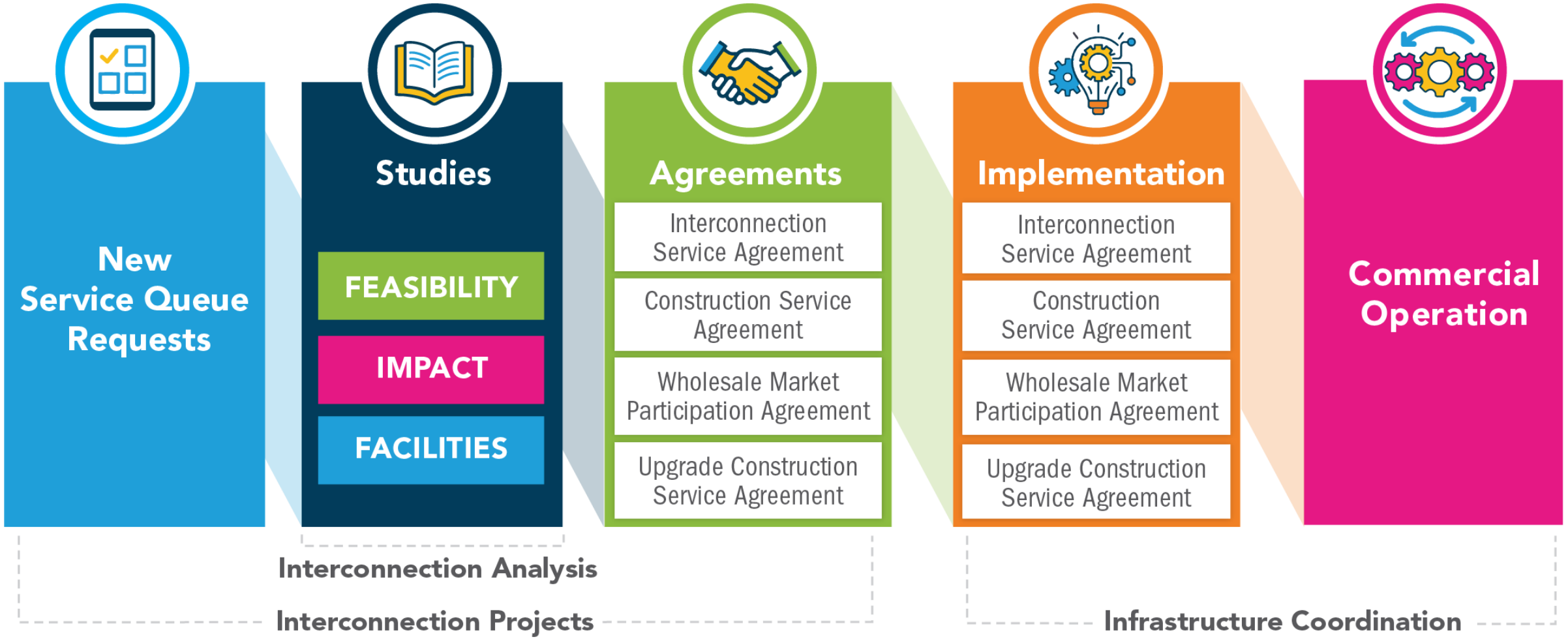
PJM's Corporate Strategy - Strategic Pillars



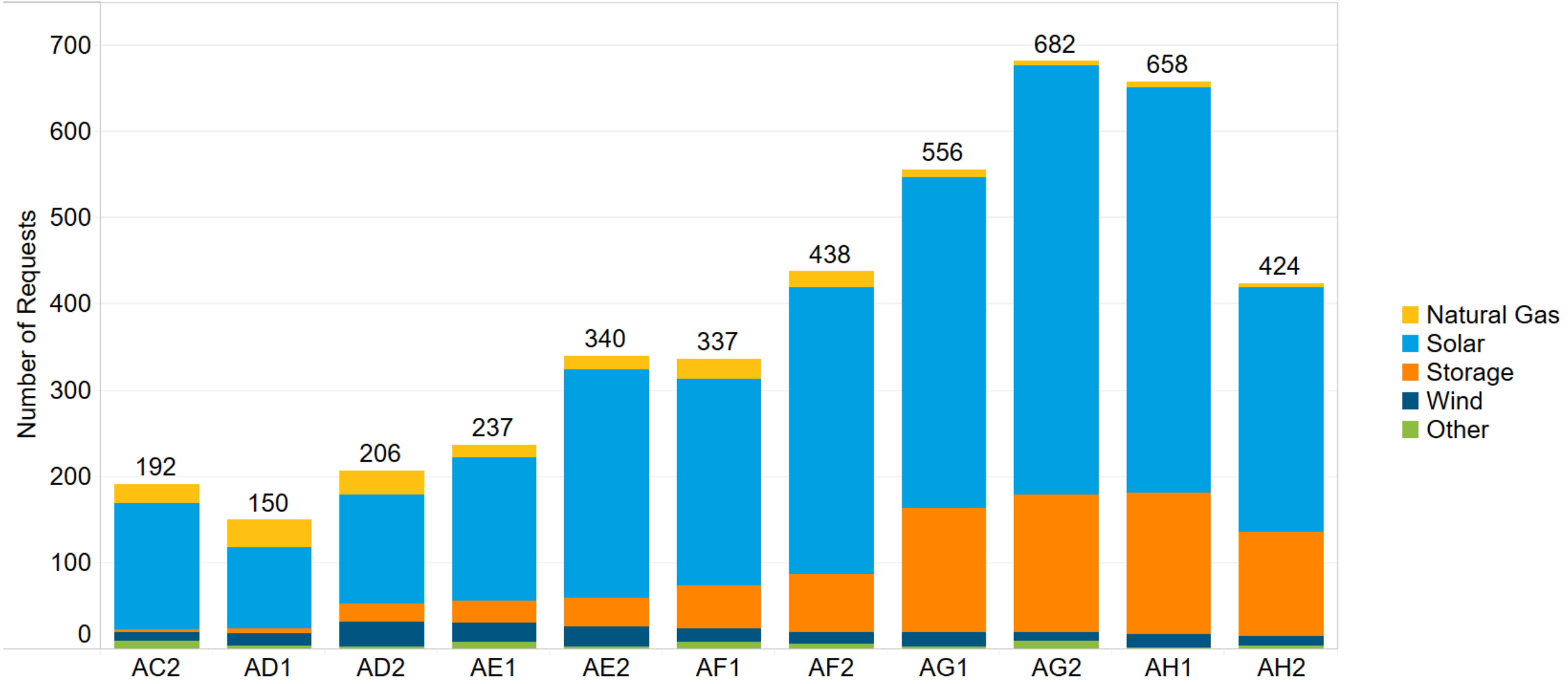
Generation Interconnection

The Queue Process Today

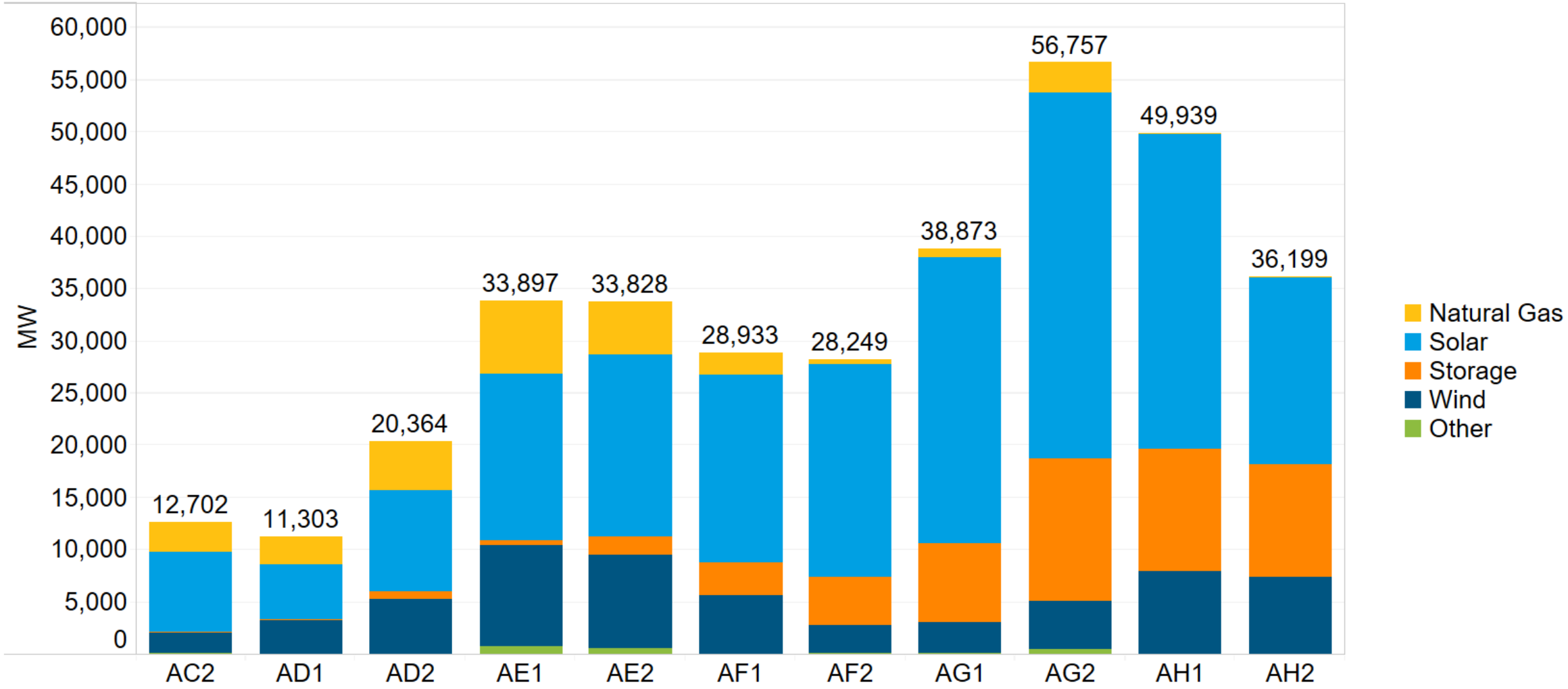
New Services Queue Process Overview



Generation Interconnection Requests – Total Number



Generation Interconnection Requests – Requested Energy



Status Quo Queue x Potential Interactions with REAP

- **Resource Development**
  - The PJM portion of Illinois has ~33,500 megawatts of renewable* nameplate capacity that is actively in PJM's queue
  - The PJM portions of Illinois, Indiana and Kentucky collectively has ~79,500 megawatts of renewable* nameplate capacity that is actively in PJM's queue.
- **Queue reform is important to support the required processing to meet Illinois goals.**

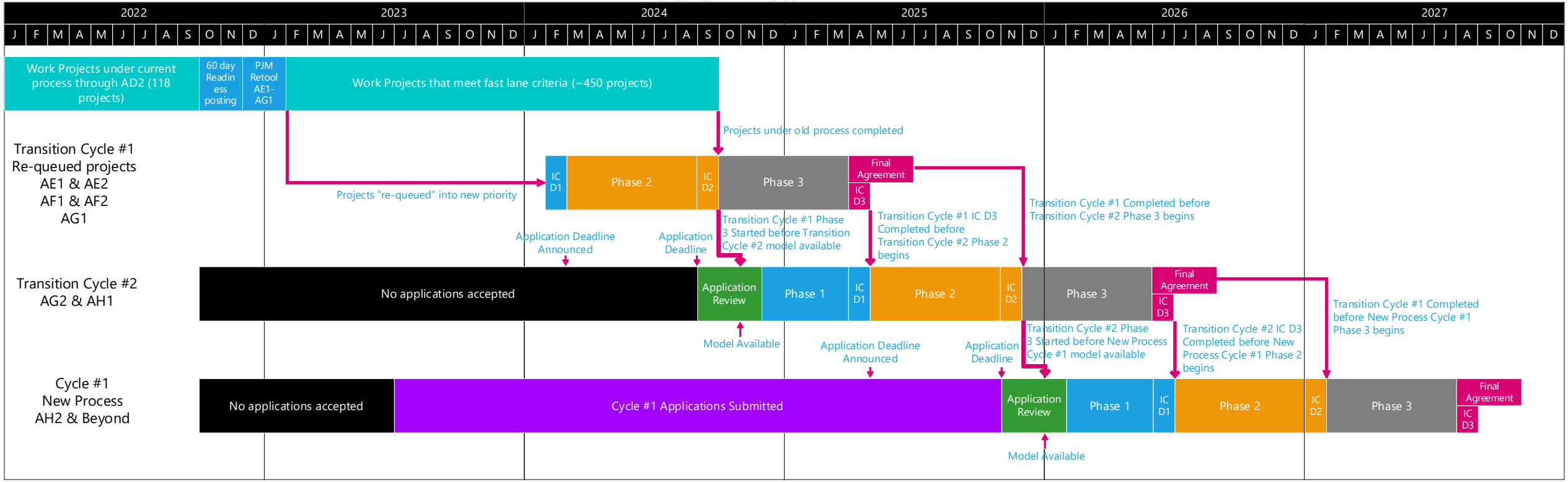
* Renewable is defined as {Solar, Wind, Storage or a hybrid of these fuel types}

Queue Reform for Tomorrow

Interconnection Process Reform

NEED	**Influx of generation entering the PJM queue has caused significant delays in processing interconnection studies:** • The current interconnection process was not designed to accommodate such a volume of projects
GOAL	**Reform the queue to better process this higher volume of resources in a timely manner:** • "First ready, first serve" • Address backlog of projects that has accumulated under current interconnection queue process
BENEFITS	**The new interconnection process will:** • Move projects through the queue in a timely manner, including fast-track eligible projects • Reduce speculative projects entering the queue • Get more renewables into service and help states meet their clean energy goals

PJM Transition Option



Given on-going regulatory proceedings, for illustrative purposes only

REAP x Potential Interactions w/ PJM Queue Reform

Illinois REAP Strategic Element # 3

- **Illinois Renewable Energy Access Zones**
  - Cluster studies to improve network access
  - Zones may assist in developers meeting site control requirements for demonstrating project certainty
  - State Agreement Approach for network upgrades
- **Increased Resource Development**
  - Predictable and shorter timeline for overall process
  - Cost certainty to interconnection customers
  - Fast track projects without network impacts
- **Potential Implications of Transition Mechanism**
  - Regulatory uncertainty around transition
  - Implementation may have spanned 2022 – 2027 for up to 79.5 GW of new renewable nameplate capacity eligible to meet Illinois goals.

Queue Reform – PJM/FERC Processes

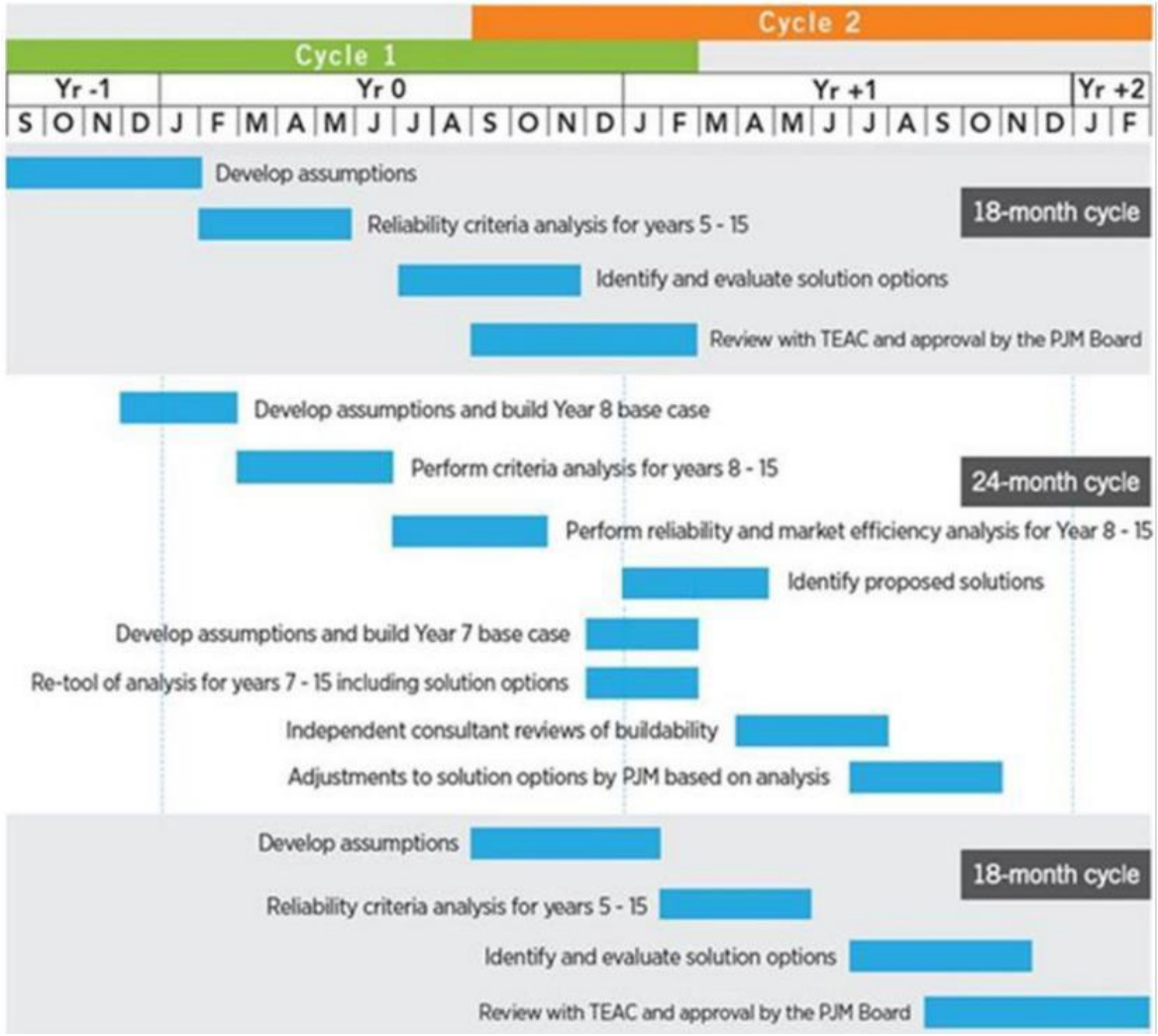
- **PJM Queue Reform Proceeding** (ER22-2110-000)
  - 08/30/22 – FERC issues Deficiency Letter
  - 09/20/22 – PJM response due
  - 10/20/22 – Replies due

- **FERC Generation Interconnection NOPR** (RM22-14)
  - 10/13/22 – Comments due
  - 11/17/22 – Reply Comments due

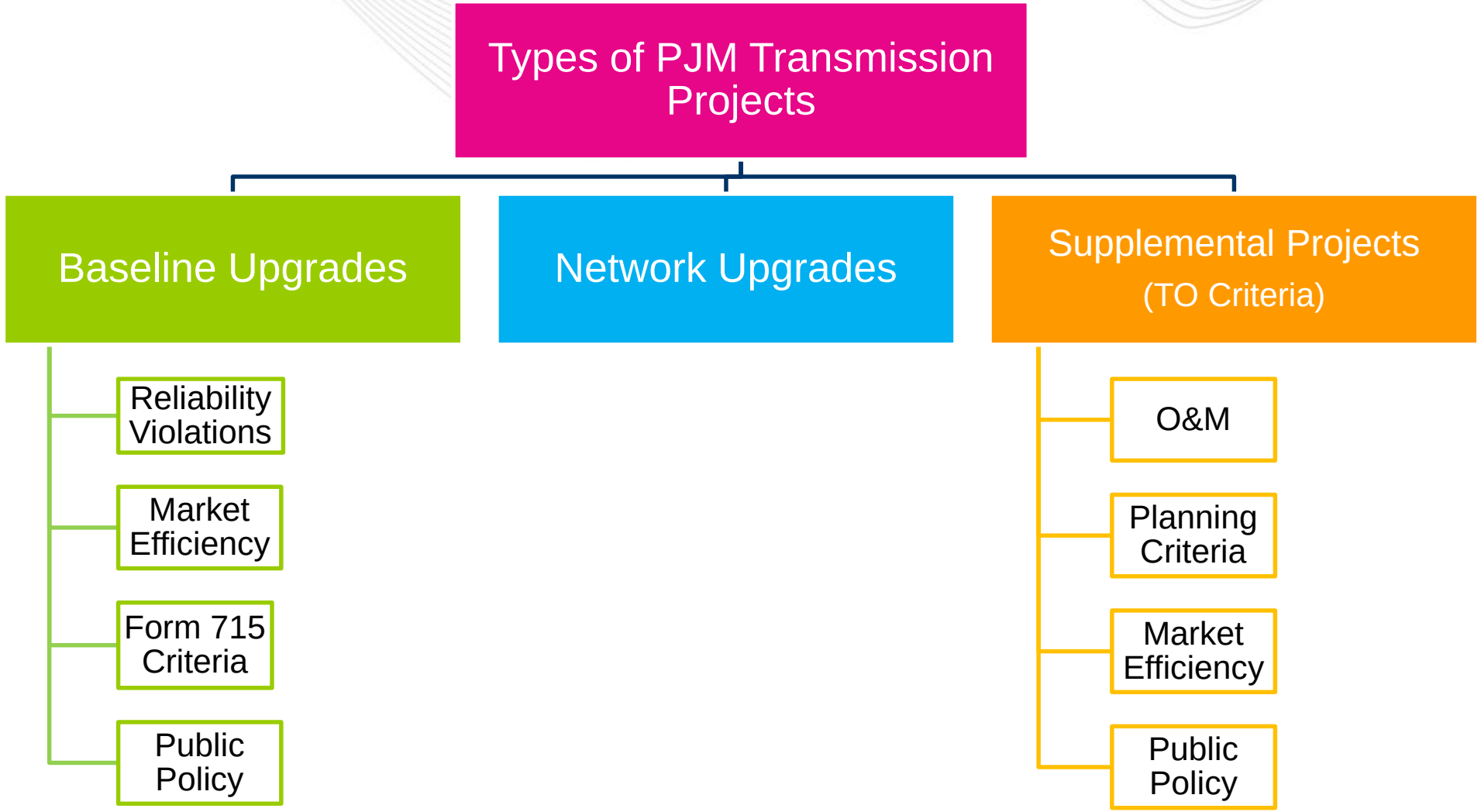
Transmission Planning

Transmission Planning Today

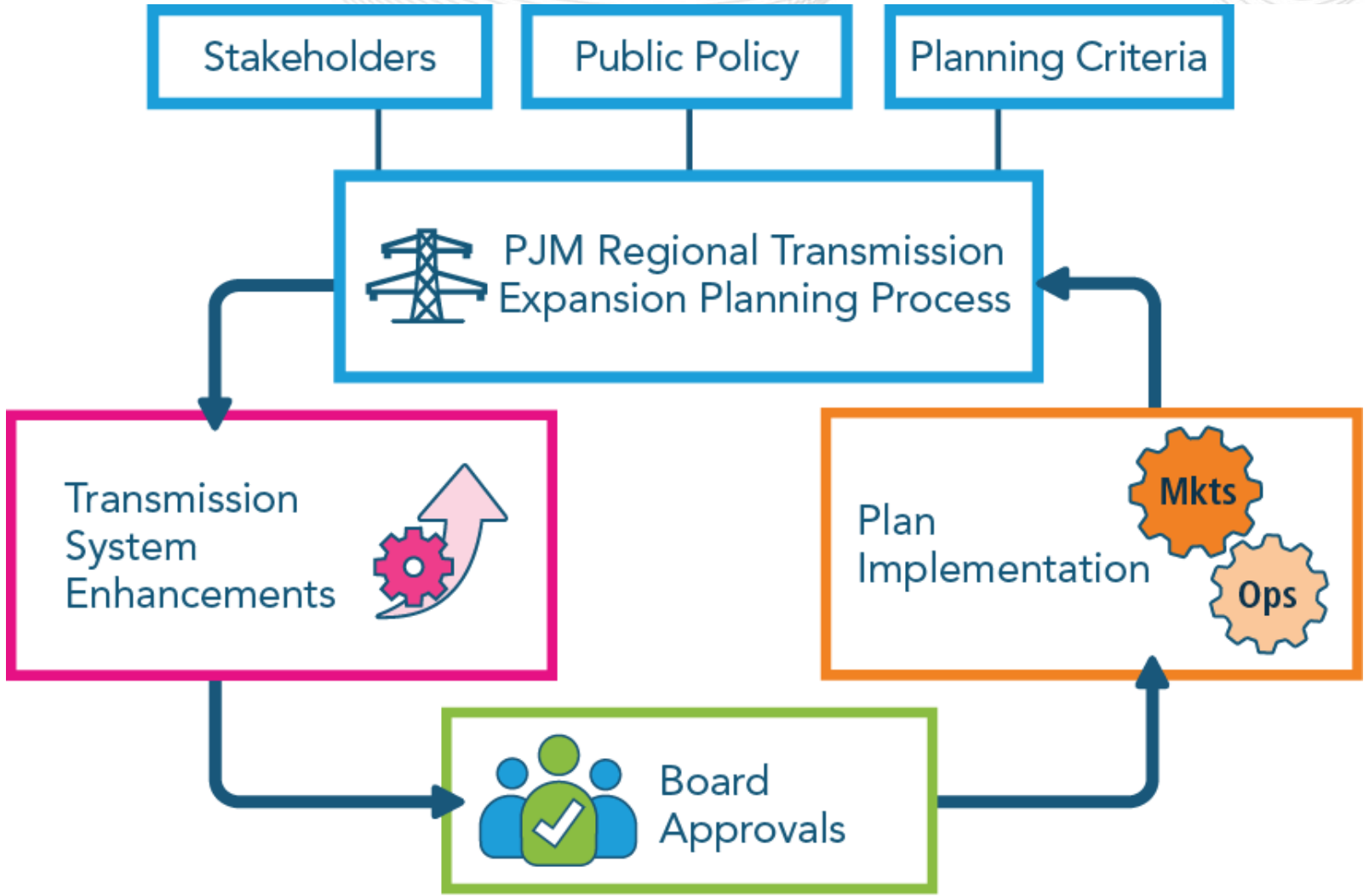
PJM RTEP Schedule



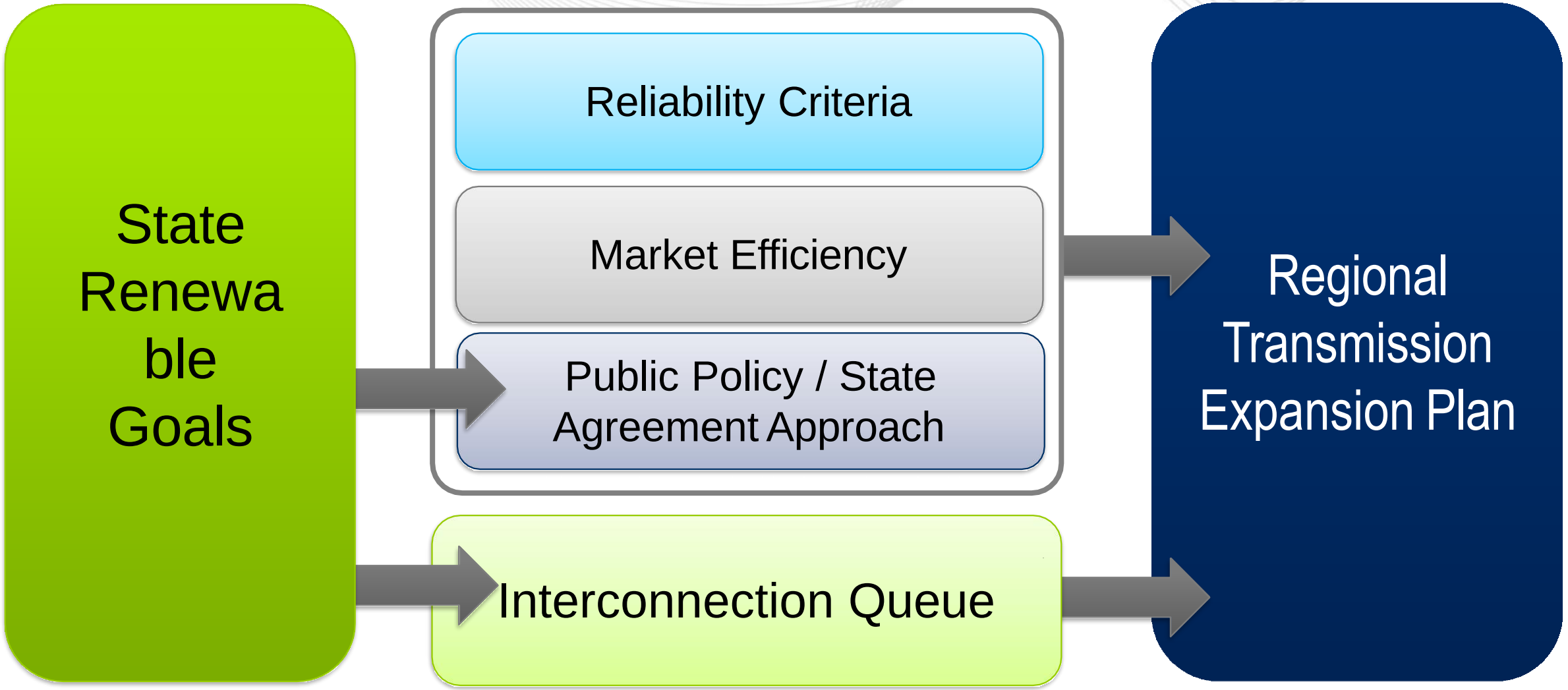
Types & Drivers of Transmission Projects



RTEP Process – RTO Perspective



Public Policy in the PJM Planning Process



What Is the State Agreement Approach (SAA)?

- PJM added an SAA transmission planning mechanism with its Order No. 1000 compliance filing (not needed for compliance with Order No. 1000), pursuant to which a state or states can request that PJM study a project designed to address public policy requirements identified by a state(s).

- If the state(s) voluntarily agrees to sponsor such a project and assumes responsibility for the allocation of all costs of the project, the SAA project will be included in the RTEP either as a Supplemental Project or state public policy project.

Possible Alternative Interconnection Cost Responsibility Options

(in no particular order)

- State underwriting for transmission to particular renewable-rich areas as identified by queue requests
- Baseline upgrades for transmission to particular renewable-rich areas as identified by queue requests
- Option for TOs to treat upgrades as supplemental projects
- Baseline upgrades for DOE-identified congestion corridors per Energy Policy Act of 2005
- Enhanced merchant funding for new transmission to renewable-rich areas
- Subscription option for generators

Independent State Agencies Committee (ISAC)

PJM Operating Agreement – Schedule 6, Sec 1.5

In addition, the Office of the Interconnection shall facilitate periodic meetings with the Independent State Agencies Committee to discuss: **(i)** the assumptions to be used in performing the evaluation and analysis of the potential enhancements and expansions to the Transmission Facilities; **(ii)** regulatory initiatives, as appropriate, including state regulatory agency initiated programs, and other Public Policy Objectives, to consider including in the Office of the Interconnection's transmission planning analyses; **(iii)** the impacts of regulatory actions, projected changes in load growth, demand response resources, energy efficiency programs, generating capacity, market efficiency and other trends in the industry; and **(iv)** alternative sensitivity studies, modeling assumptions and scenario analyses proposed by Independent State Agencies Committee.

The Office of the Interconnection shall inform the Transmission Expansion Advisory Committee and the Subregional RTEP Committees, as appropriate, of the input of the Independent State Agencies Committee and shall consider such input in developing the range of assumptions to be used in the studies and scenario analyses[.]

https://www.pjm.com/library/governing-documents.aspx

Independent State Agencies Committee (ISAC)

Independent State Agencies Committee Charter

Purpose and Responsibilities:

1) The purpose of the ISAC is to provide PJM with inputs and scenarios for transmission planning studies except Public Policy Requirements which are provided individually by the state
2) The ISAC will strive to provide PJM with information regarding potential sensitivity studies, modeling assumption variations, and scenario analyses requests that may be considered to be modeled.
3) PJM will provide the ISAC with the inputs, assumptions, and scenarios it proposes to use in its transmission planning. ISAC Members may provide PJM with feedback, either as individual states or as a group of states. Upon the request of any ISAC Member, PJM will provide its formatted modeling inputs in a manner that would enable an ISAC Member with appropriate capabilities to model additional sensitivity cases.
4) The ISAC may request that PJM conduct various transmission scenario planning studies as needed.
5) PJM will provide the ISAC with the impacts the inputs and scenarios might have on a transmission expansion plan.
6) The ISAC will not be involved in any decisions involving transmission cost allocation.
7) The ISAC will not make any transmission planning policy decisions.
8) Participation in the ISAC shall not be construed as an assessment on the merits of any specific transmission expansion project.
9) No state or ISAC Member shall be bound by or responsible for the results of any transmission planning studies conducted by PJM pursuant to inputs or scenarios provided by ISAC

REAP x Potential Interactions w/ Existing Transmission Planning

Illinois REAP Strategic Element #s 4 & 5

- **PJM Public Policy Planning**
  - Assumptions and scenarios placed into RTEP based on public policies desired to be studied
    - Demand-side policies should be incorporated into PJM's 15-year load forecast

- **PJM State Agreement Approach**
  - Network upgrade cost allocation alternatives

Enhancing Transmission Planning for Tomorrow

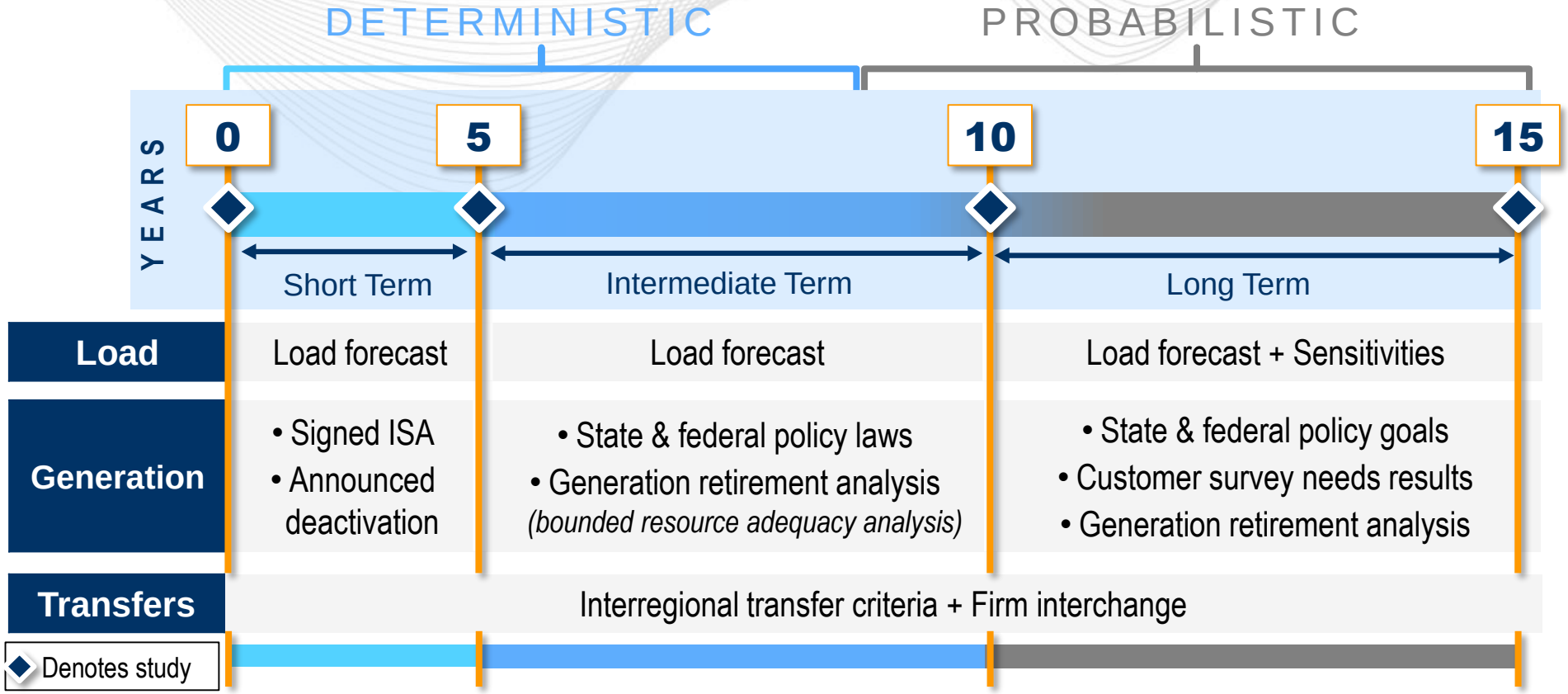
Enhanced 15-Year Long-Term Planning (Master Plan)

Scenario Based Transmission Planning

GOAL	**Develop a robust, scenario-based transmission planning criteria that:** • Analyzes an array of future generation expansion scenarios based on a documented record of customer needs and a series of regulatory "check-ins" • Establishes "guard rails" that help avoid either overbuilding or underbuilding the future transmission system
BENEFITS	**Scenario-based transmission planning will:** • Highlight areas of the system that may experience increased transfers and subsequent transmission criteria violations • Provide advanced situational awareness of potential needs for required system reinforcements

Long-Term Planning/Master Plan

PJM is engaging stakeholders to develop a robust and transparent transmission planning process capable of proactively meeting customer needs and policy goals.



Implications: Planning over longer horizons increases the uncertainty the projected models and resultant system needs, increasing the risk that the planned transmission may be overbuilt or insufficient.

Scenario-Based Transmission Planning Terminology

Scenario parameters are building blocks that are defined in order to construct a scenario.

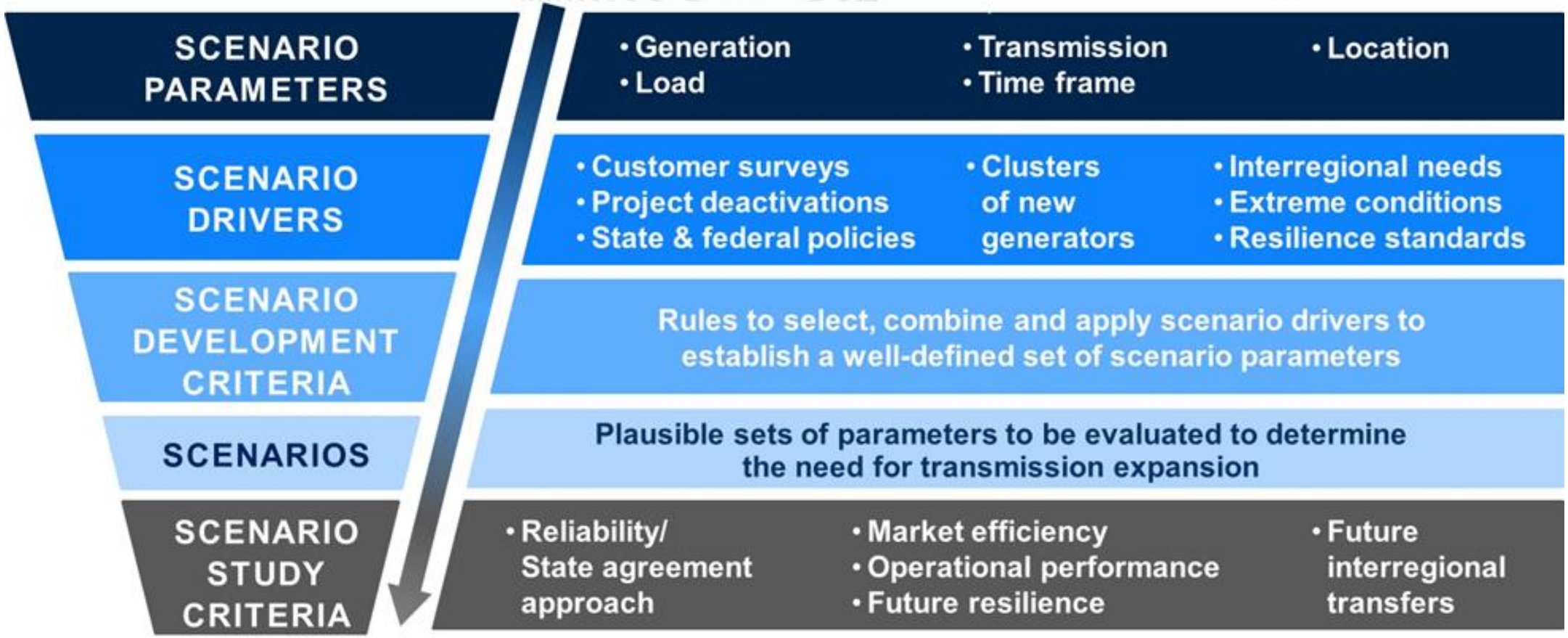
Scenario drivers are those factors that impact scenario parameters.

Scenario development criteria are the rules by which the scenario drivers are selected.

Scenario is a plausible set of parameters to be evaluated as part of power flow base case.

Scenario study criteria are the methodology by which the scenario is analyzed including the decision-making process that determines whether potential reliability violations warrant transmission expansion.

Scenario-Based Transmission Planning



Major elements of scenarios (assumptions in the case(s))

- Load Forecast
- Generation type and location
- Retirement assumptions
- Underlying case assumption for interregional transfer capability

The current process out to 15 years uses generation loaded in the 5-year case to meet the load and then scales the load and generation as needed to meet the load forecast at 15 years

How can we change the longer term assumption inputs if trends are changing?

Considerations to Planning Timeframes

Potential drivers

Long-Term Planning Inputs

- Sensitivities to load forecast
- Policies driving new generation and retirements
- Customer survey needs
- Interregional transfer criteria

Intermediate-Term Planning

- Refined assumptions

Known drivers

Near-Term Planning Inputs

- Current RTEP modeling
- Interregional transfer criteria

QUESTIONS TO ANSWER:

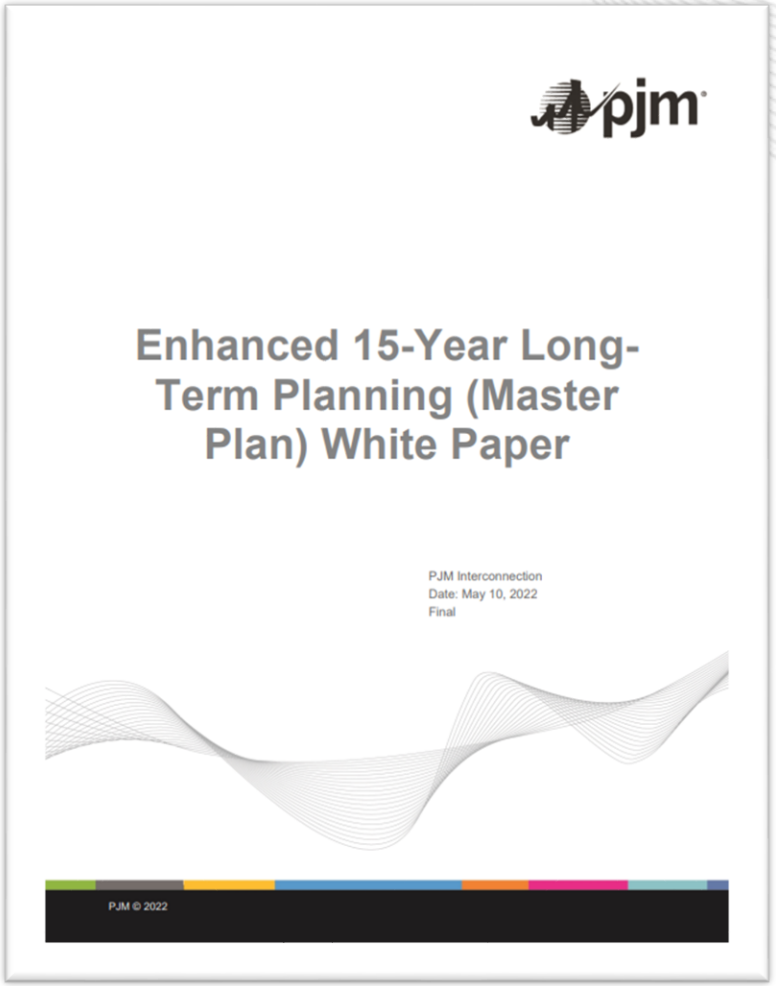
- How to identify these potential long-term drivers?
- When do these potential drivers become actionable planning inputs?
- Decision making criteria and role of FERC and the states?
- Are changes needed to the short-term RTEP analysis?

Goal is to find a way to bridge long-lead time projects identified in the Intermediate Term for build-out in the RTEP.

Illinois REAP Strategic Element #s 4 & 5

- **Proactive planning of new transmission**
  - Ensure consideration of state policies and support from states for overall implementation plan to effectuate those strategies
  - Consider non-wires solutions, including grid-enhancing technologies that can enhance throughput of existing grid or further utilize existing rights of way

Transmission Reform – PJM/FERC Processes

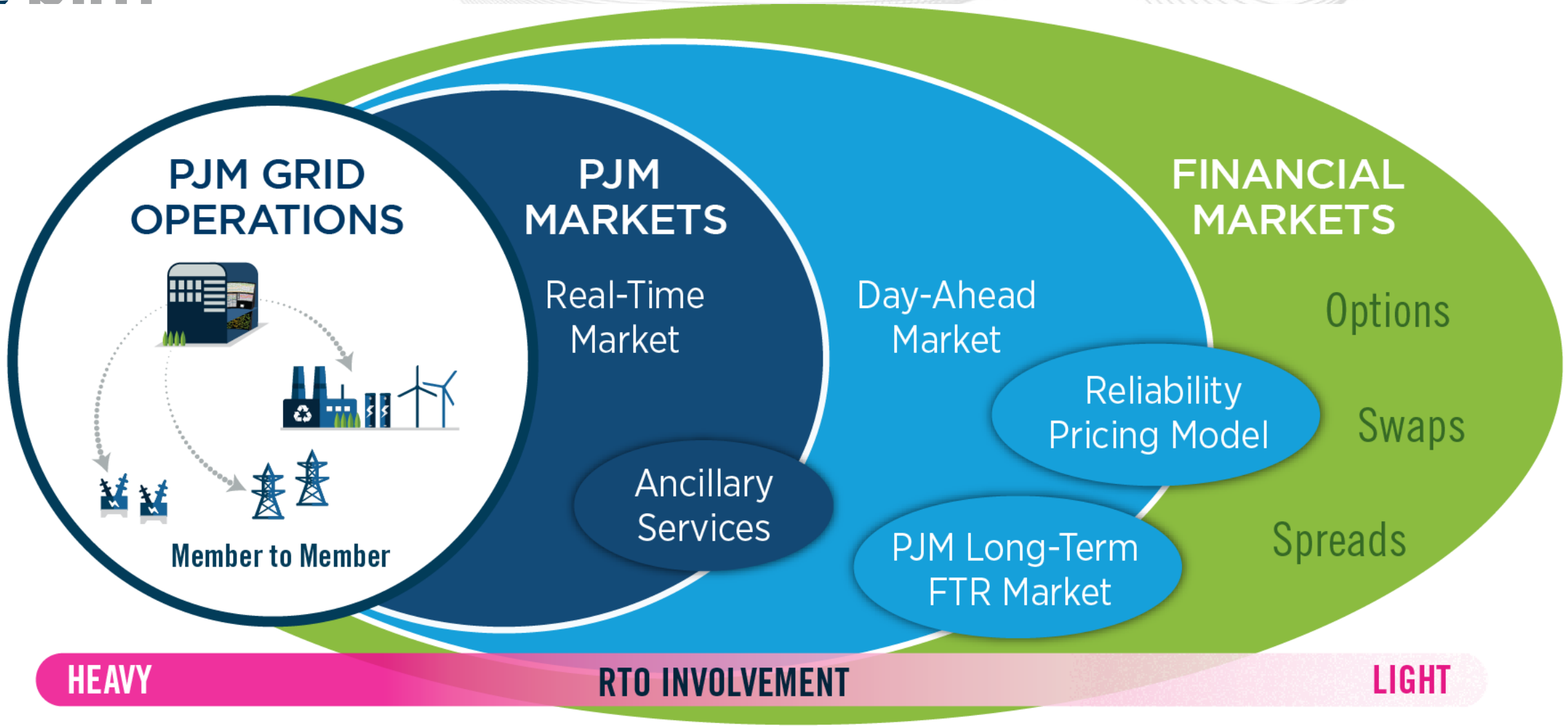


- **PJM Master Plan**
  - 2023 – Progression aligned with NOPR developments

- **FERC NOPR** (*Building for the Future Through Electric Regional Transmission Planning and Cost Allocation and Generator Interconnection* - RM21-17)
  - 08/17/22 – Comments due
  - 09/19/22 – Reply Comments due
  - TBD – FERC Final Rule

https://www.pjm.com/-/media/committees-groups/committees/pc/2022/20220525-long-term/enhanced-long-term-planning-discussion-document.ashx

Wholesale Markets

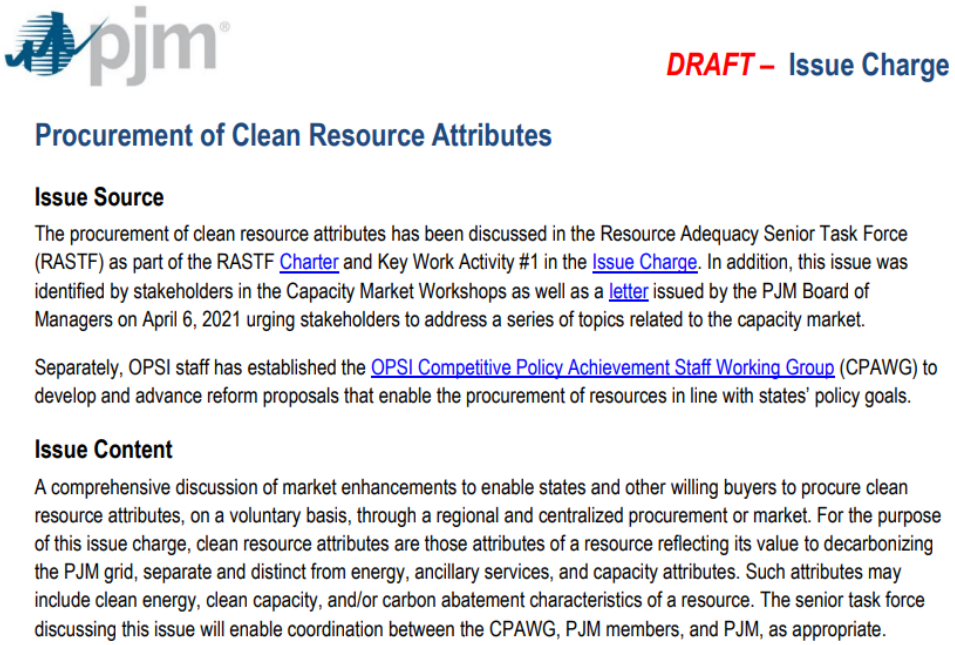

PJM GRID OPERATIONS
Member to Member
PJM MARKETS
Real-Time Market
Day-Ahead Market
Ancillary Services
FINANCIAL MARKETS
Options
Reliability Pricing Model
Swaps
PJM Long-Term FTR Market
Spreads
HEAVY
RTO INVOLVEMENT
LIGHT

Illinois REAP Strategic Element # 6

- TBD

Wholesale Markets – PJM Processes

- **PJM Clean Procurement Sr. Task Force**
  - 01/31/23 – Development of packages
  - 05/31/2023 – Potential Tariff Language Development



DRAFT – Issue Charge

Procurement of Clean Resource Attributes

Issue Source

The procurement of clean resource attributes has been discussed in the Resource Adequacy Senior Task Force (RASTF) as part of the RASTF Charter and Key Work Activity #1 in the Issue Charge. In addition, this issue was identified by stakeholders in the Capacity Market Workshops as well as a letter issued by the PJM Board of Managers on April 6, 2021 urging stakeholders to address a series of topics related to the capacity market.

Separately, OPSI staff has established the OPSI Competitive Policy Achievement Staff Working Group (CPAWG) to develop and advance reform proposals that enable the procurement of resources in line with states' policy goals.

Issue Content

A comprehensive discussion of market enhancements to enable states and other willing buyers to procure clean resource attributes, on a voluntary basis, through a regional and centralized procurement or market. For the purpose of this issue charge, clean resource attributes are those attributes of a resource reflecting its value to decarbonizing the PJM grid, separate and distinct from energy, ancillary services, and capacity attributes. Such attributes may include clean energy, clean capacity, and/or carbon abatement characteristics of a resource. The senior task force discussing this issue will enable coordination between the CPAWG, PJM members, and PJM, as appropriate.

https://www.pjm.com/committees-and-groups/task-forces/capstf